Space Weather Forecast

Issued on Friday, 06 January 2023 at 12:58 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Strong solar activity throughout. Slight chance of Minor Geomagnetic Storm intervals today (6th Jan).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been High, with a strong flare originating from the largest and most magnetically complex sunspot region, which is located in the southeast quadrant. However, this strong flare did not produce a coronal mass ejection (CME). This region, along with at least two of the remaining six sunspot regions on the visible disc, has the potential to produce significant flares.

Solar Wind / Geomagnetic Activity: Solar winds started at background levels, before increasing to slightly elevated and elevated levels, peaking at 546km/s at 06/0903UTC. Magnetic field strength was initially at moderate levels, before declining briefly to weak levels, increasing back up to moderate. The important north-south component was at Weak to Moderate levels. Geomagnetic activity has been Quiet to Unsettled (Kp0-3) throughout.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to be Low to Moderate, with a chance of strong flares through the forecast period.

Solar Wind / Geomagnetic Activity: The effects of a CME which arrived at Earth on 04 January are expected to continue to subside over the next 12 hours. A CME may glance Earth today (6th Jan), but with low confidence. A weak high speed stream, from either coronal hole 60 or 61 is likely to persist today (6th Jan), then declining thereafter. Geomagnetic activity is expected to be Quiet to Unsettled today, with isolated Active periods likely, and a slight chance of a minor geomagnetic storm. From tomorrow (7th Jan) predominantly Quiet conditions are expected.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at background with no solar radiation storms occurring. However, there is a slight chance of these rising in response to any larger flares that may occur, and perhaps exceeding the S1/Minor Radiation storm level.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	5	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	50	50	50	50
Very Active	R3 to R5 X	Yes	20	20	20	20

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	20	20
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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